Henry Skinner

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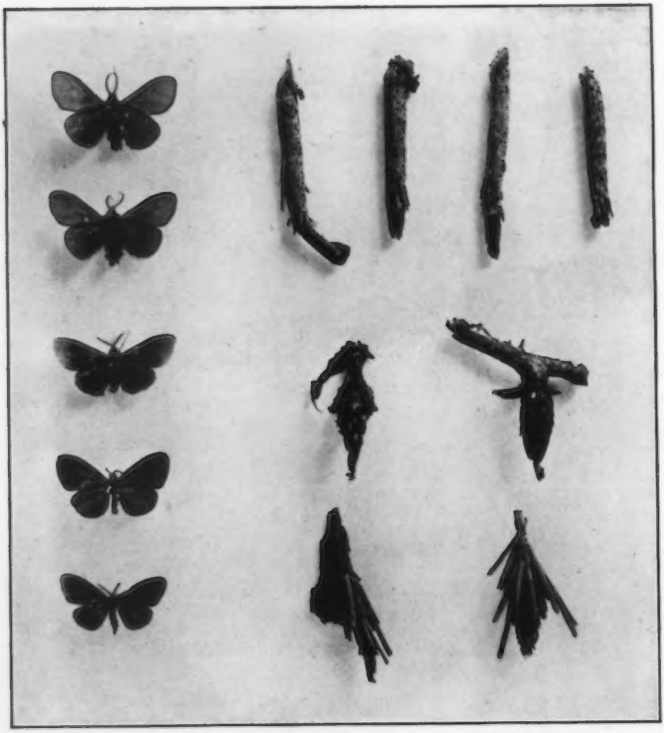

NORTH AMERICAN PSYCHIDAE.—JONES.

EURUKUTTARUS EDWARDSII HEYL, 2 MALES, 4 CASES.
EURUKUTTARUS POLINGI BARNES AND BENJ., 1 MALE.
PLATOECETICUS GLOVERII PACK., 1 MALE, 2 CASES.
EURUKUTTARUS CONFEDERATA G. & R., 1 MALE, 2 CASES.

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North American Psychids: edwardsii Heyl. (carbonaria Pack.) (Lepidoptera, Psychidae).

By FRANK MORTON JONES, Wilmington, Delaware.

(Plates II and III)

Psyche carbonaria was described by Packard in 1887, from two males from Texas. Nothing, apparently, was then known of the habits of this insect, which has continued to be a rarity in our collections, most of the specimens dating back many years to Belfrage's time, with central Texas as their locality and October or November as their date of occurrence. In September and October of 1923 the author made a collecting trip through the southwest and west, with Psychidae as the special object of search. The first stop was at Fort Worth, Texas, with the intent of visiting Belfrage's presumed locality for this insect (Clifton, Bosque County), some seventy miles distant; but upon the advice of Dr. W. M. Winton, of Texas Christian University, search was first made in more accessible areas of like character near Fort Worth and Dallas, with the result that *carbonaria* turned up in the first half-hour of actual search.

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This insect is an inhabitant of the chalk-hill region of Texas. It was found on these hills at the outskirts of Fort Worth; similarly, just to the west of Dallas; and again at Alamo Heights, San Antonio, always where the white chalk showed through the scanty ground-cover vegetation. At intermediate and adjacent points of different character it was absent or rare. The larvae are evidently ground feeders, in September creeping up posts and tree-trunks and affixing their cases for pupation. Emergence of the males takes place in the morning (6 to 9.30 A. M.); and from cases gathered in September, 1923, the earliest emergence was October 18, the latest, November 7. The species is apparently single brooded, the winter being passed in the egg stage. To our knowledge of this insect as briefly characterized by Packard from scanty material, may now be added the following:

Egg.—.7 mm. × 1.1 mm.; ellipsoidal, usually distorted by mass-pressure; yellowish-white, smooth, unpolished, somewhat moist and adherent (the closely-packed egg-mass does not readily separate when dropped into water), and so delicate in texture that it cannot be removed from the pupa-shell without rupturing many of those contained.

Larval case.—Length 22-27 mm.; about 4 mm. in diamter at widest part (near the proximal end); almost cylindrical, but tapering slightly and gradually toward the distal end, which is ornamented with a few slender fragments of vegetable matter applied longitudinally; the case is smooth, tough, and exceptionally firm in texture, its outer surface is the color of weathered wood, its inner surface white; the apparently smooth outer surface, under the lens is seen to be a mosaic of minute vegetable fragments firmly embedded in the silk. The larger applied fragments at the distal end protect and partly conceal a short terminal portion of flimsy texture which closes the orifice in collapsed triangular form, the emerging pupa rupturing the triangle at its angles, thus dividing this lower portion, usually rather symmetrically, into three lobes or flaps. For pupation the larva attaches the case firmly, at a height from the ground varying from one to six feet, and apparently by preference to a weathered post or tree-trunk; the point chosen for attachment is usually a crevice or small cavity which conceals the base of the case, which consequently projects at any angle, even almost perpendicularly. In these

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attached cases males were found to predominate in the ratio of 40 to 1, so the usual habit of the ♀ may be to remain concealed at or near the ground, for obviously it must differ in this respect from the ♂.

Larva, ready for pupation.—Length 16-20 mm.; width of head 1.6-1.8 mm.; dull brownish-white; the head and the more heavily chitinized areas of the thoracic segments contrastingly marked with white and with dark brown having a purplish tinge. Of the three white markings of the epicranium (Plate III, fig. 8), the small rounded lateral patch is the most constant; the vertical marking sometimes joins the lower pale area, and the two may expand across the front until most of the dark frontal markings become vestigial, even the frontal punctures being included in the merged pale areas. A line joining the second adfrontal and the frontal seta, extended, passes below the frontal puncture. The abdominal setae, especially those below the spiracles, are exceedingly small and weak; the small seta shown (Plate III, fig. 9) on the cephalic margin of segments T2 and T3 (apparently *x* of Forbes, *gamma* of Fracker) was not detectable in all specimens when examined up to 100 x, those studied including both blown and alcoholic material.

Pupa of ♂ (Plate III, fig. 6, 7).—Length 10-12 mm.; reddish amber-brown to dull dark brown; the head, the thorax and the rugose portions of the abdominal segments darker than the remaining areas; the anterior portions of the abdominal segments, to the seventh inclusive, are striately rugose, strongly so dorsally; ventrally, the mesothoracic wings overlap about one-half of the third abdominal segment, the mesothoracic legs reach or fall slightly short of the wing-margin, the antennae terminate on a line opposite the anterior margin of the third abdominal segment, the prothoracic legs slightly exceed this point; the caudal segments are striate, they are curved ventrad, and they bear the usual pair of strongly chitinized hooks; a dorsocephalic spined ridge is present on each of segments 6, 7, and 8, much more prominently on 8, where it is comb-like and projecting; a dorsocaudal row of vestigial spines, their points directed cephalad, is borne by the fifth abdominal segment; the abdominal spiracles are slightly raised, concolorous; the maxillae (Mosher nomenclature) equal or slightly exceed the labial palpi. In agreement with the structure of the larval case, the pupa is more long-cylindrical in shape than that of *cacocnemos, tracyi,* or *celibata.*

Pupa of ♀ (Plate III, fig. 5).—Length 15 mm.; pale dull

amber and lacking the striate rugosity of the ♂ pupa; compared with the pupa shell of the ♂, that of the ♀ is much less rigid in texture and less opaque, the contained eggs being individually visible through the thin papery integument; the dorsal portions of the thoracic segments are thickened and their color deepened to dull reddish-brown; the caudal extremity is bluntly rounded and it lacks the prominent hooks of the ♂; abdominal segments 7 and 8 have each a dorsocephalic row of microscopic blunt spines, their points directed caudad; and segment 5, near its dorsocaudal margin, bears a still more vestigial row of cephalad-directed fine spines.

Adult ♂ (Plates II, III).—Expanse 19-22 mm.; black throughout; the body rather robust, with hairy divergent vestiture; antenna with 27 (sometimes a few more) joints, broadly bipectinate, the shaft and its pectinations scaled above; legs unarmed. Wings broad, moderately opaque, with narrow hair-like scales; primaries with costa arched, outer margin slightly rounded, apices moderately acute; secondaries broad, rounded; 11-7 veins, 7 of primaries from the cell, or sometimes from the stalk of 8 and 9; 4 and 5 of both wings connate (or varying even to wide separation) at cell; the anal veins of primaries have the basal portion of 1*c* well indicated; 7 and 8 of secondaries are joined by an oblique bar mid-way of the cell, but not again beyond this point; the furcate plate of the abdomen is wide, with rather short and slightly divergent straight rods, the opposite (dorsal) plate much smaller, T-shaped.

Adult ♀.—Length 12 mm.; yellowish-white; the thoracic segments dorsally brown with a tinge of olive, ventrally purplish about the vestigial legs; head pale brown, with darkly-pigmented eyes; legs and antennae rather more distinctly indicated than usual in related species; the almost colorless down of the abdomen is very loosely attached and almost completely deciduous in oviposition and emergence.

Packard in his original description states that he had before him "Two males from Texas. Collection of Mr. Edward L. Graef; one of these* * * * retained in my own collection"; of these two, Graef's specimen is preserved in the Brooklyn Museum, fully identified as Packard's type by its pin-labels; in the Packard collection at Cambridge are *two* specimens of this insect, each labeled simply, "Dallas, Texas, Boll," and neither bearing type indication; under these cir-

cumstances the Brooklyn Museum specimen must be considered the type.

Compared with the recently described *polingi* Barnes & Benjamin, this insect, even in flown condition, is immediately and conclusively separable by its narrow hair-like wing-scales, the denser wings of *polingi* being clothed with larger and much broader scales (See Plate III, figs. 10, 11).

There remains for comparison, however, the insect described by Heylaerts (C. R. Soc. Ent. Belg., ci., 1884) as *Manatha edwardsii,* which has been standing on our lists as a synonym of *gloverii* Packard. The unique type of *edwardsii* is in the Oberthur collection in France; in 1923 it was sent to England, to the Rev. C. R. N. Burrows, for comparison with some of our North American species; from his report it became apparent that *edwardsii* is a larger and more robust insect than *gloverii;* following this, M. Charles Oberthur published (Etudes, XXI (II), 170, Pl. DLXVI, fig. 4889, 1923) a colored figure of *edwardsii,* strengthening our growing suspicion of the identity of *edwardsii* Heylaerts and *carbonaria* Packard; later (1924), through the kindness of M. René Oberthur and of Prof. C. Houlbert, the writer was given access to the type of *edwardsii* at Rennes, and there compared it with fresh specimens of *carbonaria* which had already been compared with Packard's type. *Edwardsii* Heylaerts and *carbonaria* Packard are identical, *edwardsii* having priority. The apparent discrepancies in the two original descriptions are due to the study, by their authors, of scanty and undissected material. This insect was evidently distributed (by Belfrage, perhaps also by Boll), misidentified as *T. ephemeraeformis* Steph.; for not only does the Heylaerts type bear a written name-label thus misidentifying it, but in the American Museum of Natural History, under *carbonaria* Pack., is a specimen from the Hy. Edwards collection, similarly labeled, with Belfrage's name as collector.

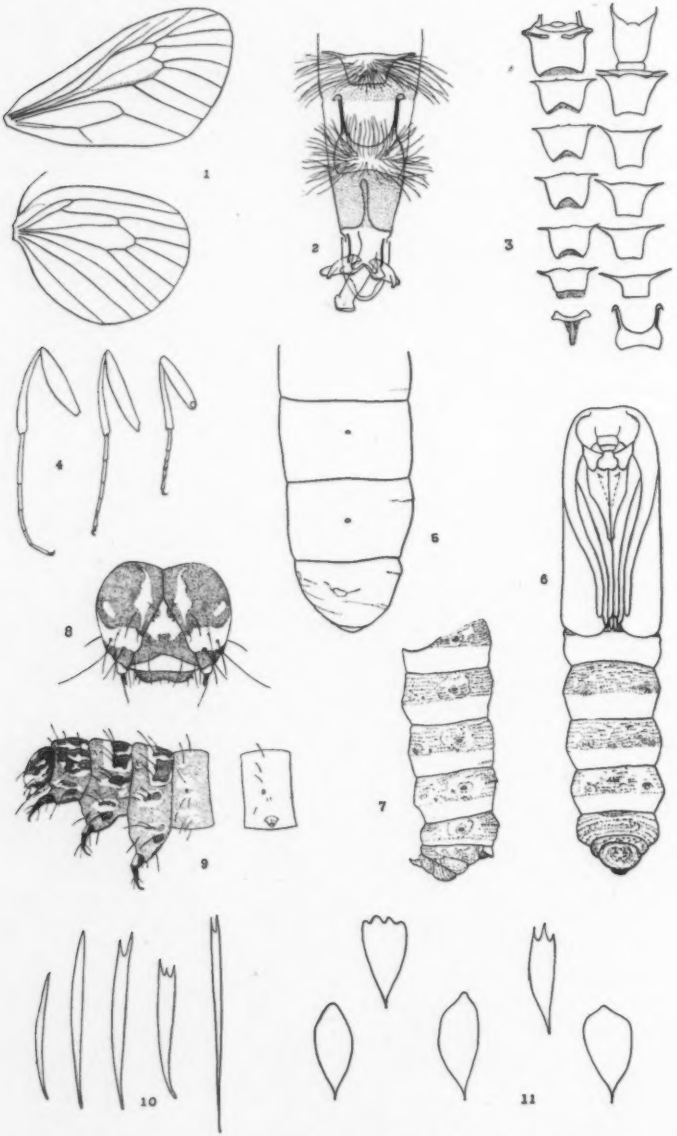
Heylaerts also described (C. R. Soc. Ent. Belg., ccviii, 1884) what he identified as the larval case of *edwardsii,* but his description does not apply to the case of this species as

determined by breeding, and his material is not preserved with the ♂ type at Rennes; however, in the remains of the Heylaerts collection in the Rijks Museum at Leiden (for access to which the writer is indebted to Heer Van Eecke) are two cases standing above a label, "Edwardsii Heyl.", with Texas indicated as their locality and "Collection C. V. Riley" as their origin. They agree with Heylaerts' description (one is the large case of a ♀); but they are not cases of *edwardsii*, but of *confederata* G. & R.

Finally, the former generic references of this insect are not admissible. *Psyche* Schrank is now restricted to *viciella* Schiff. (genotype) and its allies, 12-8 veined insects; *Manatha* Moore, by the characterization of the genus and by an examination of the genotype *(albipes* Moore, preserved in the British Museum) is also 12-8 veined; *Platocceticus* Packard is usually 12-8 veined, and has no bar joining 7 and 8 of secondaries; *Pachythelia* Westw. has the fore tibia armed with a long spine. Barnes and Benjamin have referred their allied species, *polingi*, to *Eurukuttarus* Hamps.; though the early stages of the genotype of this latter genus are unknown, comparison of the males *(pileatus* Hamps., *edwardsii* Heyl.) shows them to be in substantial agreement, in the characters which in this family have served for generic separation. Multiplication of genera being inadvisable under these circumstances, *edwardsii* Heyl., for the present, should stand with *polingi* B. & B., in *Eurukuttarus* Hamps., its bibliography and synonymy becoming:

Eurukuttarus edwardsii Heyl.

Heylaerts, C. R. Soc. Ent. Belg., ci, 1884 *(Manatha)*.
Heylaerts, C. R. Soc. Ent. Belg., ccviii, 1884 (larval case of *confederata* G. & R., in error for *edwardsii* Heyl.).
Packard, Ent. Amer., III, 51, 1887 *(Psyche carbonaria* n.sp.).
Smith, List Lep. Bor. Am., 29, 1891 *(Psyche carbonaria* Pack.).
Kirby, Cat. Lep. Het., 502, 1892 *(Manatha)*.
Kirby, Cat. Lep. Het., 515, 1892 *(Psyche carbonaria* Pack.).
Neumoegen & Dyar, Jour. N. Y. Ent. Soc., II, 119, 1894 (= *gloveri* Pack.).
Neumoegen & Dyar, Jour. N. Y. Ent. Soc., II, 119, 1894 *(Psyche carbonaria* Pack.).
Dyar, List N. A. Lep., 353, 1902 (=*gloveri* Pack.).



EURUKUTTARUS EDWARDSII (FIGS. 1-10). E. POLINGI (FIG. 11).—JONES.

Dyar, List N. A. Lep., 353, 1902 *(Eurycyttarus carbonaria* Pack.).
Smith, Check List Lep. Bor. Am., 82, 1903 *(Eurycyttarus carbonaria* Pack.).
Dyar, Insec. Ins. Mens., I, 104, 1913 *(carbonaria)*.
Barnes & McDun., Can. Ent., XLVI, 30, 1914 *(carbonaria)*.
Dyar, Can. Ent., XLVI, 179, 1914 *(carbonaria)*.
Barnes & McDun., Check List Lep. Bor. Am., 125, 1917 (= *gloveri* Pack.).
Barnes & McDun., Check List Lep. Bor. Am., 125, 1917 *(Eurycyttarus carbonaria* Pack.).
Dyar, Insec. Ins. Mens., XI, 2, 1923 *(Pachytelia carbonaria)*.
Dyar, Insec. Ins. Mens., XI, 4, 1923 *(Manatha)*.
Oberthur, Etudes Lep. Comp., XXI (II), 170, 1923 *(Platoeceticus)*.
Barnes & Benj., Cont. N. H. Lep. N. A., V (3), 187, 1924 (*? carbonaria)*.

EXPLANATION OF PLATE III

Eurukuttarus edwardsii Heyl.

1. Venation, wings of ♂.
2. Genitalia, with adjacent abdominal plates.
3. Abdominal plates, dorsal and ventral.
4. Legs.
5. Caudal segments, pupa of ♀.
6. Pupa of ♂.
7. Caudal segments, pupa of ♂.
8. Head of larva, last instar.
9. Larva, last instar.
10. Wing-scales, 100 ×.

Eurukuttarus polingi Barnes and Benj.

11. Wing-scales, 100 ×.

A Preliminary List of the Ants of Kansas (Hymenoptera, Formicidae).

(Continued from page 12.)

By WM. P. HAYES, Kansas Agricultural Experiment Station.

MYRMICINAE.

MYRMICINA GRAMINICOLA subsp. AMERICANA Emery. This species is recorded by Tucker (1909, p. 289) from Lawrence, who further comments that males were found in September and October. This insect, according to Wheeler (1910), occurs in the Northeastern states.

MONOMORIUM PHARAONIS Linn. None of the lists of Kansas Hymenoptera contain this common species. It is a cosmopolitan species. In this state it is often confused with *Solenopsis molesta* Say, both of which infest houses and are spoken of as "red ants." It occurs widespread over the state.

M. MINIMUM Buckley. This small black species constructs crater nests in sandy or gravelly situations. The writer has found workers hibernating in a nest in December at a depth of 18 to 24 inches, and at Winfield found them under stones, April 29. In the State Agricultural College collection are three wingless queens and four workers collected by Marlatt. The Winfield specimens were determined by Wheeler, and the Riley County specimens by M. R. Smith.

M. MINUTUM var. MINIMUM Buckley. This variety, as cited, is given in the Tucker list as occurring at Lawrence, Kansas, in June and July.

SOLENOPSIS MOLESTA Say. This pernicious pest is known over the state as the kafir ant or tiny thief ant. It attacks the planted seeds of sorghums and other crops and causes an immense amount of damage in southern Kansas. It is also a pest of houses and on the other hand is a useful insect on account of its scavenger habits. The results of two years' study of the biology of this ant by the writer (1920) are reported elsewhere. The species is widespread throughout the United States and Mexico. The writer has found it in many of the counties in the eastern half of the state. It has not been found and reported west of Smith and Barber Counties.

Unfortunately, considerable confusion exists in the American literature with regard to this species. Originally described as *Myrmica molesta,* it, 30 years later, was redescribed by Buckley (1866, p. 342), from specimens collected in the vicinity of Washington, D. C., as *Myrmica exigua.* This name has not, so far as the writer is able to learn, crept into the economic literature. After another period of 20 years, the same ant was again described by Mayr (1886, p. 461) as *Solenopsis debilis.* It will be noticed that Mayr was the first to place the species in the genus *Solenopsis Westwood.* Under this name the species has, much too frequently, been reported as noxious and of considerable economic importance. Previous to the time of Mayr's paper, many references to this ant were made under the name *Solenopsis fugax* Latr. This mistake is accounted for by the close resemblance of *S. molesta* to the well-known Euro-

pean *S. fugax.* Several workers (Forbes, Webster, et al.) referring, in earlier papers, to *S. molesta* used the name *S. fugax;* and, following the advent of Mayr's description, made similar references under the name *S. debilis.*

According to Wheeler, "Emery (1894, p. 277) was the first to insist that this (*debilis*) was merely a synonym of Say's *molesta.*" Commenting further on the synonymy of the species, Wheeler in a letter says, "*Solenopsis fugax* is a European species and does not occur in this country. It is extremely close to *Solenopsis molesta,* however. Undoubtedly, all references to *fugax* in American literature refer to *molesta.*"

Additional confusion has arisen between *S. molesta* and the little red house ant, *Monomorium pharaonis* Linn. This is due, in part, to the similarity of habits, but more to their likeness in coloration. Both species are spoken of as tiny, but only a superficial observation is needed to note the much smaller size of *S. molesta.*

Myrmica minuta Say, a meagerly described form, is thought by such an authority as Emery (1894, p. 277) to be a synonym of *molesta.*

Crevecoeur's list contains this species cited as *Solenopsis debilis.*

S. TEXANA Emery. Tucker records this species from Lawrence. A female was found by him in June at twilight. Wheeler's list records this species only from Texas, and in view of the writer's work with *S. molesta,* the determination of this species from Kansas appears doubtful.

PHEIDOLE PILIFERA Roger. Soldiers of this species were found by the writer attacking workers of *Solenopsis molesta* Say under stones at Winfield, Kansas, April 19, 1914. These were identified by Wheeler. This record is apparently new for the state. In Wheeler's list its range is given as "Eastern and Northern States."

PH. SITARCHES Wheeler. In the State Agricultural College collection are workers and soldiers of this species determined by M. R. Smith from Riley County, collected March 21 and April 30, under stones. This species in Wheeler's list is from Texas and has apparently not been noted previously in this state.

PH. SITARCHES Wheeler. New var. Workers of this species were collected in Cowley County by the writer in 1916. They were submitted to Wheeler who pronounced them a new variety

which is, as far as the writer can ascertain, still undescribed.

PH. VINELANDICA Forel var. Workers of this species were collected at Winfield, April 19, under stones. This species occurs in the "Eastern States" and no record was found of its occurrence in Kansas.

PH. HAYESI M. R. Smith. Specimens of this species found attacking planted corn and kafir seed at Manhattan were sent to M. R. Smith, who pronounced it a new species and who stated that Wheeler had concurred in the belief that it was a new and undescribed species. A description of this ant appeared in ENTOMOLOGICAL NEWS for July, 1924, page 251. Because of its damage to planted seed in the state, this insect bids fair to become of considerable importance and studies are now being carried on to learn of its life history. So far this species has been found at Manhattan only.

CREMASTOGASTER LINEOLATA Say. This species without reference to any of its varieties or subspecies is listed from Lawrence by Tucker (1908), who found females and workers in April, workers in June, and males and females in September. It is also found listed by Crevecoeur as new. Wheeler gives the range of this species as northern states and Canada.

C. LINEOLATA subsp. LEVIUSCULA Mayr. Tucker reports taking this subspecies from a dead standing elm tree at Lawrence, and at Wichita he found workers during April.

C. LINEOLATA var. CLARA Mayr. Workers of this variety (determined by W. M. W.) have been collected at Winfield a number of times by the writer. They were found under stones in several instances with colonies of *Solenopsis molesta* Say. This is apparently a new state record.

C. VICTIMA subsp. MISSOURIENSIS Pergande. This species (determined by M. R. S.) was collected by the writer at Manhattan under stones April 13, 1917. It is a new state record.

STENAMMA sp. Undetermined males of this genus are in the State Agricultural College collection from Manhattan collected in September, both by Faville and Marlatt.

APHAENOGASTER MARIAE Forel. In a recent letter, M. R. Smith writes that he has seen this species among ants from the Colorado Agricultural College collection sent him by C. R. Jones which bore Kansas labels. This is apparently a new state record.[2]

A. TREATAE Forel. A new record for Kansas. Workers of

[2]Other species noted from this collection from Kansas are *Formica pallide-fulva* Latr., *Eciton schmitti* Emery, *Prenolepis imparis* Say, and *Leptothorax curvispinosus* Mayr. Smith also has a record of *Monomorium minimum* Buckley from Lawrence. All of these are discussed elsewhere in this paper.

this species (determined by M. R. S.) were collected abundantly in March and April by Norton.

A. FULVA Roger. Although not reported from this state, this species may occur since Wheeler (1916, p. 586) says that *A. tennesseensis,* the next listed species, occurs only in regions where *A. fulva* occurs.

A. TENNESSEENSIS Mayr. This species was first reported from Lawrence by Tucker, at which time he called it *Stenamma* (*Aphaenogaster*) *tennesseensis.* It is listed, mispelled, as an addition to the Kansas list by Crevecoeur. In the State Agricultural College collection are workers (determined by M. R. S.) from Riley County collected in March.

POGONOMYRMEX BARBATUS subsp. RUGOSUS Emery. Three workers from Grant County, collected August 16 by Popenoe, two workers from Hamilton County, collected August 27 by Popenoe, and one worker from Meade County, collected July, are in the State Agricultural College collection, (determined by M. R. S.). According to Wheeler, the range of this subspecies is from Arizona to California. This is evidently a new state record and a somewhat eastern extension of its range.

P. OCCIDENTALIS Cresson. This insect, known commonly as the Mound-building Prairie Ant, is widely distributed over the western part of the state. Because of its economic importance it is one of the best-known Kansas ants. The work of Dean (1908) on its life history has revealed many facts concerning its biology. This species was first noted in Kansas lists by Bridwell (1899). Specimens are at hand from Russell, Wallace, Hamilton and Trego Counties, and the writer has collected specimens in Cowley County. Dean (loc. cit.) has shown that it occurs throughout the state "west of a line running through Belleville in Republic County and Oxford in Sumner County."

MYRMICA RUBRA Linn. This species without varietal distinction is reported from Lawrence by Tucker where he found it in September.

M. RUBRA Linn. var. SULCINODOIDES Emery. This variety is listed from the state by Crevecoeur. Its range according to Wheeler is Utah, Colorado and New Mexico.

LEPTOTHORAX SCHAUMI Roger. This species is in the Crevecoeur list as a Kansas species.

L. CURVISPINOSUS Mayr. Also listed by Crevecoeur. This and the previous species are probably from the vicinity of Ottawa.

L. sp. This undetermined species is also found in the Crevecoeur list. It may be one of the foregoing species or a different one.

(To be continued)

A New Subspecies of Brenthis myrina Cram. (Lepid.: Nymphalidae).

By Wm. Barnes and F. H. Benjamin, Decatur, Illinois.

Brenthis myrina tollandensis race nov.

Similar to topotypical (New York) *myrina;* the black markings on the upper side tending to be narrower and cleaner cut except toward the wing bases which are slightly more suffused than in eastern specimens.

The most conspicuous difference is on the under side of the hind wing which in the present race has much more yellow, the yellow untinged by brown, the usual brown patches in the subterminal area between veins 2-4 and 4-7 reduced and powdery. The subterminal apical region of the fore wing agrees with the hind wing in its clear yellow color and brown powdery patch, appearing quite yellow instead of being heavily suffused by the brown patch found on eastern specimens.

B. myrina occurs from Labrador to British Columbia and southward to Pennsylvania and Utah. As might be expected, there appears to be a gradual transition from the typical form though paler colored Alberta and Utah material toward the Colorado form.

These are the first Colorado specimens we have seen, although the Barnes Collection is rich in Colorado material from Glenwood Springs, Denver, Hall Valley, etc., the result of extensive collecting by Bruce, Oslar and Barnes. A letter from Mr. Oslar may give the reason why the Colorado form is not usually taken. We quote: "A few days ago I was up in Moffat County, Colorado, and I turned up an Argynnid (the Brenthis family) new to me . . . . In Holland's book there's nothing like it . . . . They certainly are a swift flier and always on the wing against terrific winds blowing all the time at the altitude they occur (about 10,000 feet) and seldom stopped to feed, had to be caught on the fly."

Type locality: Tolland, Moffat County, Colorado, altitude approximately 10,000 feet.

Number and sexes of types: Holotype ♂; Allotype ♀; 5 ♂, 7 ♀ Paratypes; all collected by E. J. Oslar, July, 1924. *Types in:* Barnes Collection.

Some Additional New Species of Heteroptera from the Southern United States, with Characterization of a New Genus.

By W. S. BLATCHLEY, Indianapolis, Indiana.

Since the appearance of my former paper entitled "Some Apparently New Heteroptera from Florida,"[1] I have continued the work on my Manual of Heteroptera and have found among the material examined examples of five additional species which are apparently new to Science. Two of these belong to genera not hitherto known to be represented in the eastern United States, while a third represents a new genus which is characterized below. Unless otherwise stated the types of the new species are in the collection of the author.

Family LYGAEIDAE.

Ischnodemus pusillus sp. nov.

Brachypterous form: Elongate, very slender. Body wholly black, thickly clothed with very fine silvery-gray pubescence, the head and pronotum with a bluish tinge; pronotum with a velvety black bar across the basal fourth; antennae and legs pale brownish-yellow, the apical joint of former piceous-black; beak dark brown, the basal joint paler; elytra represented by small white pads without dark veins but with an oblique black spot behind the middle.

Antennae about as long as head and pronotum united, joint 1 not passing tip of tylus, 2 and 3 slender, the latter slightly the shorter, 4 fusiform, one-half longer and much stouter than either. Beak reaching middle coxae. Pronotum subquadrate, its disk nearly evenly convex, finely, evenly and sparsely punctate, without either transverse or longitudinal impression, its sides parallel from base to middle, rounded and converging near apex. Scutellum small, flat, impunctate. Elytra reaching only to base of second dorsal, their tips narrowly rounded and separated by a space nearly equal to their width, their inner margins oblique. Length 3—3.3 mm.

Dunedin, Florida, February 18; three brachypterous specimens sifted from the roots of tufts of grass in low moist grounds. It is our smallest and blackest species, easily known by the subquadrate, evenly convex pronotum with black basal

[1] Entomological News, March, 1924, pp. 85-90.

cross-bar, large piceous apical antennal and small white elytral pads.

Type a male taken at Dunedin, Florida, February 18, 1924.

Family EMESIDAE.

Genus **Malacopus** Stal.

"Stal in his "Bidrag till Rio Janeiro-Trakens Hemipter Fauna,"[2] founded this genus, the principal characters of which are as follows:

Head declivent behind, wider across the eyes than long, its hind portion with sides strongly converging from the eyes backward; eyes very prominent, coarsely granulated; beak with two basal joints strongly swollen; antennae and legs with numerous long erect hairs, the first antennal surpassing base of mesonotum. Pronotum quadrate, not fused with mesonotum; the latter with front declivent, its sides feebly converging from base to apex, their margins not carinate, hind margin concave. Scutellum divided into two obtusely triangular parts, the front one the shorter, the apex of each with a short spine. Elytra surpassing abdomen by one-fourth their length, gradually widened from base to apex, the inner apical margin widely and shallowly obliquely concave. Front coxae half the length of femora; trochanters unarmed; front femora armed beneath their full length with very numerous short black-tipped spines; front tibiae three-fourths the length of femora.

The generic type of Stal was his *M. cellularis* described from Rio Janeiro. A second species, apparently hitherto undescribed, occurs in southern Florida. It varies from Stal's generic characterization only in having the vertex of head armed with two small obtuse tubercles, instead of "inermi, tumescente," as stated by him.

Malacopus longicornis sp. nov.

Elongate, robust for the family. Head and pronotum fuscous-brown, the former with one, the latter with three, pale stripes; mesonotum dull yellow; scutellum dark brown; elytra pale brown, the margins, main nerves and all the nervures pale yellow; under surface piceous-brown, the genital segments paler; antennae and legs pale yellow, annulated with pale brown.

[2] Kongliga Svenska Vetenskaps-Akademiens Handlingar, Pt. I, Vol. II, 1860, 80.

Hind lobe of head with an obtuse tubercle each side; antennae with joint 2 slightly longer than 1, 3 one-fourth as long as 2, twice as long as four. Disk of mesonotum with two obtuse tubercles on basal third. Front scutellar spine strongly inclined backward, hind one erect. Genital plate of male small, scoop-shaped. Length 10—11 mm.

Cape Sable and Key West Florida, February 23-March 1. Five specimens were taken by beating in dense hammocks along the margins of tide-water lagoons. *Type* a male from Cape Sable, Florida, February 26, 1919.

Family ANTHOCORIDAE.

Subfamily *Dufouriellinae*.

Genus **Physopleurella** Reuter.

This genus was founded[3] by Reuter for a single species, the *Cardiasthethus mundulus* White, from Hawaii. I have at hand examples of an apparently undescribed species taken in Florida which agree in all but a few minor respects with the generic characters as given by Reuter, which are substantially as follows:

Head distinctly longer than the width across eyes, the projecting tylus shorter and narrower than interocular width; eyes prominent, occupying the full thickness of the head; beak shorter than head, its second joint subulate, scarcely reaching middle of eyes. Pronotum with hind margin deeply and widely sinuate or concave; disk with preapical transverse impression fine but evident; median transverse impression ill defined, the area in front of it with callus but little elevated, and with a short posterior longitudinal median groove; hind portion depressed at middle. Elytra entire, the membrane 4-veined, the three outer veins with bases remote and equidistant one from the other, the inner one with base forked, enclosing a small triangle. Osteolar channel surpassing middle of metasternal plate, its apical portion curved backward. Front femora in our species more evidently swollen than the others, with the lower inner margins beset with numerous fine setae; front tibiae distinctly curved. Mesopleurae strongly rugose.

Physopleurella floridana sp. nov.

Elongate-oblong, subparallel, pubescent. Head, front lobe of pronotum, scutellum and under surface pale to dark reddish-

[3] "Monographia Anthocoridarum Orbis Terrestris." Actorum Societatis Scientiarum Fennicæ, XIV, 1884, 124.

brown, strongly shining; hind lobe of pronotum with the basal margin and humeral angles fuscous-brown; elytra, except membrane, dull straw-yellow with the cuneus and a more or less evident cross-bar across the apical third of clavus and corium fuscous; membrane whitish-hyaline, the basal half tinged with dusky; antennae, beak and legs pale brownish-yellow.

Joint 1 of antennae slightly surpassing the truncate tip of tylus, 2 linear, about as long as head, 3 and 4 more slender, subequal, together slightly longer than 2. Pronotum as above described, its sides obtusely margined, the deeply concave hind margin with a fringe of yellowish hair; disk with a short ridge each side of middle connecting the two lobes, the hind lobe depressed and punctate at middle, its humeral angles broad, obtusely rounded. Scutellum with basal portion less elevated than usual, apical portion flattened, with a bilobed fovea at base, apex acute. Elytra but slightly surpassing abdomen, clavus finely irregularly punctate, corium and embolium very minutely punctate, all the punctures each bearing a short, fine appressed hair. Genital plate of male transverse, its hind margin broadly rounded. Length 2.8-3 mm.

Dunedin and Royal Palm Park, Florida, March 5-April 3; three specimens beaten from dead leaves of the cabbage palmetto. The short subulate beak, setose front femora, curved front tibiae and peculiar sculpture of pronotum distinguish this from any of our known eastern species of the subfamily.

Type a male taken at Dunedin, Florida, April 3, 1923.

Family VELIIDAE.

Genus **Microvelia** Westwood.

Among some specimens of aquatic Heteroptera received for study from C. S. Brimley, of Raleigh, North Carolina, were examples of a *Microvelia* which differs from any of our known species in a number of particulars, and is therefore described as follows:

Microvelia parallela sp. nov.

Brachypterous form: Elongate-oblong, sides parallel or nearly so. Color a nearly uniform dark brown, clothed with very fine appressed grayish hairs; front margin of pronotum reddish-brown; antennae fuscous-brown, the second joint sometimes paler; legs brownish-yellow, tinged with fuscous, the front femora wholly yellow; abdomen without spots of silvery pubescence.

Head strongly convex, its median impressed line distinct. Antennae relatively stout, subequal in length to head and thorax united; joints 2, 3 and 4 almost subequal in length, 1 shortest, 3 most slender, 4 fusiform, slightly longer than 3, but little more than half as long as width of interocular area. Pronotum subquadrate, about one-third wider than long, front margin truncate, hind one very slightly rounded; disk with reddish front margin smooth, remainder distinctly punctate and with an entire longitudinal median carina. Mesonotum concealed; metanotal triangles very small. Hind tibiae straight in both sexes. Abdomen with sides subparallel, the connexiva wide, subvertical, male; distinctly narrowed behind with connexiva strongly reflexed against the dorsum, female; last three dorsals with a fine longitudinal median impressed line. Length 1.5-1.8 mm.

Type, a male taken at Raleigh, North Carolina, May 22; *allotype*, same place and date; both in the collection of the Division of Entomology, North Carolina Department of Agriculture. The small size, parallel body, uniform brown color, short subequal joints of antennae and strongly reflexed connexiva of female, readily distinguish this from all our other species. It is apparently most closely related to *M. hinei* Drake, but in that species the mesonotum is visible and the fourth antennal is more than twice as long as second, and but little shorter than the interocular width.

Family GELASTOCORIDAE.

Subfamily *Nerthrinae*.

Since 1911 I have had in my collection a species of Gelastocoridae from Arch Creek, Florida, under the name of *Nerthra stygica* Say, it having been so determined for me by E. P. Van Duzee. In March, 1923, I took near Dunedin, Florida, examples of a second and somewhat similar member of the same family. When I came to study these critically, in connection with Say's original description and Bueno's excellent paper on *Nerthra stygica*,[4] I soon found that my Dunedin specimens were the true *N. stygica* and that the other was an apparently unnamed species possessing characters of generic importance which differ from those of any defined genus of

[4]Ohio Naturalist, V, 1905, 287.

the family. I therefore found for it the genus *Glossoaspis*[5] as characterized below. The relationship of this genus to the other North American genera of the family may be readily determined by the following key:

Key to North American Subfamilies and Genera of Gelastocoridae.

a. Elytra not wholly coriaceous, the corium, clavus and membrane distinct, the membranes overlapping.

b. Front tarsus of adults with two claws; eyes very prominent, subpedunculate (subfamily Gelastocorinae). *Gelastocoris* Kirkaldy.

bb. Front tarsus of adults with a single claw; eyes much less prominent, sessile (subfamily Mononychinae). *Mononyx* Laporte.

aa. Elytra wholly coriaceous, meeting in a straight sutural line, the corium and clavus not differentiated, the membrane wanting; eyes reniform, sessile; front tarsus of adult with a single claw (subfamily Nerthrinae).

c. Elytra not soldered together along the median line, their suture distinct and disk without lines of elevations; scutellum with basal portion very short and broad, apical portion strongly narrowed to form a tongue-like wedge between the bases of elytra; margins of abdomen coarsely crenate. ..... *Glossoaspis* gen. nov.

cc. Elytra soldered together along the median line, their suture indistinct and disk roughened with oblique lines of short acute elevations; scutellum broadly triangular, fused with elytra, its apex obtuse; margins of abdomen entire..... *Nerthra* Say.

Glossoaspis gen. nov.

Head immersed in thorax to eyes, vertex very short, front vertical, the front of body therefore appearing as if truncate or squarely cut off; eyes small, reniform; ocelli distinct, each set on a small interocular tubercle. Pronotum short, very broad, the disk with median portion convex, uneven; sides strongly flattened. Elytra wholly coriaceous, closely united along a median straight line, their usual divisions wanting, the costal margins expanded near base to form a short broadly rounded lobe. Scutellum with basal portion very short, nearly

[5] From the Greek *glosso* "tongue" and *aspis* "shield," referring to the peculiar tongue-like apical half of the scutellum.

one-half as wide as pronotum, separated from the much narrower apical portion by a sinuate transverse groove, the apical portion forming a tongue-like wedge between the bases of elytra, its apex narrowly rounded. Front legs short, femora very stout, beneath broadly and shallowly grooved, the front margin of groove evenly widened throughout its length and armed with a row of numerous close-set, very short denticles, the hind margin of groove scarcely raised; front tibiae slender, cylindrical, feebly curved, the tarsal joint very short, the long curved acute single claw appearing as if united to the end of tibia. Middle and hind legs slender, each with two tarsal claws; middle tarsi 1-jointed, hind tarsi 3-jointed, the third joint as long as the others united. Meso- and metasterna each with an erect tubercle which is compressed or laminate on three sides at base.

The generic type and only known species is

Glossoaspis brunnea sp. nov.

Subquadrate, broadly rounded behind. Color above a nearly uniform dark brown, when living coated with an earthy incrustation; sides of pronotum, apical portion of scutellum, tubercles of elytra and posterior half of each connexival dull yellow; sterna and femora in great part dull yellow; abdomen, tibiae and tarsi dull fuscous-brown, the posterior apical angle of each ventral paler.

Beak concealed beneath the strongly deflexed head, its apex visible between the front coxae. Pronotum two and a half times as wide as long, its transverse impression placed very close to base; side margins straight and subparallel, rounded into base, the apical angles obtuse, slightly prolonged; hind margin trisinuate; disk with sides broadly flattened, median portion with a transverse convexity formed of four broad obtuse tubercles separated by wide shallow grooves, the two median tubercles much the larger. Elytra at base slightly narrower than pronotum, conjointly oval, reaching tip of abdomen, disk of each distinctly not strongly concave, not punctate and without setae, each with a short oblong tubercle at middle of base, a larger obtuse one at middle and a third much smaller, close to suture at apical fourth. Connevivum rather broadly exposed behind the subbasal lobe of elytra, its margin coarsely crenate. Apex of front trochanters forming a short bifid tooth. Genital plate of male concealed beneath the sixth ventral. Other structural characters as above given. Length 8.2 mm.; width 5 mm.

Type a single male taken March 21, 1911, from the muddy

margins of Arch Creek, Florida. This is probably the *Mononyx stygicus* of Uhler,[6] nec Say, and the *Nerthra stygica* Say of Howard,[7] but, as pointed out by Bueno (loc. cit.), it is not Say's species. If it is the form so treated by Uhler and Howard, Bueno is in error in supposing that it is "either *Mononyx fuscipes* Guer. or *M. nepaeformis* (Fabr.)," as those two species are both true members of *Mononyx*, having the elytral membrane present and overlapping.

The Anal Lobe of Pseudococcus comstocki Kuw. (Homop.: Coccidae).

By W. S. HOUGH, Virginia Crop Pest Commission.

In his study of California mealy bugs Ferris (1918) pointed out the value of the cerarii in generic and specific determinations. But there are variations in the cerarii, especially the anal lobe cerarii of certain species of *Pseudococcus*, which may make specific identification rather difficult for anyone except a specialist who has abundant material for comparison. The writer has in mind particularly the two most widely known outdoor species in eastern United States, *Pseudococcus comstocki* Kuw. and *Pseudococcus maritimus* Ehrh.[1]

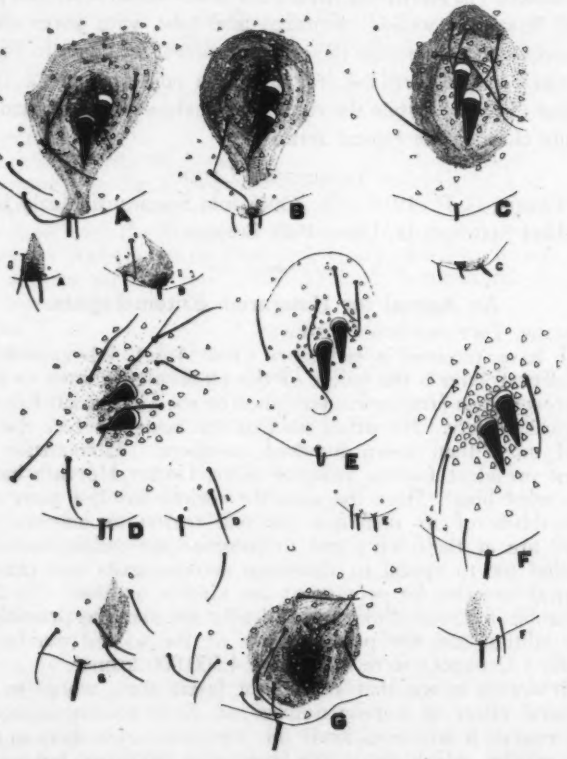
During the past two years the former species was the subject of a rather extensive biological investigation in Northern Virginia, where it became a pest on the umbrella catalpa *(Catalpa bungei)*, and in the course of these studies certain variations in the chitinization of the anal lobe were noticed to be quite frequent.

Figs. A to E, inclusive (the large letter indicates the dorsal aspect and the small letter the ventral aspect of the same lobe), show a range of variations in the chitinization of the anal lobe of *Pseudococcus comstocki* from what may be considered the typical form (Fig. A) to forms (Figs. D and E) which may be confused with a figure or description of the anal lobe of

[6] Standard Natural History, II, 1884, 264.
[7] The Insect Book, 1902, pl. XXXIX, fig. 16.
[1] Thanks are due Dr. C. H. Kennedy, of Ohio State University, for helpful suggestions in morphological studies of this insect.

Pseudococcus maritimus (Fig. F) unless specimens of the latter are at hand for comparison.

The series of variations shown was selected from 150 adult specimens, all of which had been stained for the same length of time (12 hours) in Magenta Red and mounted in the same



way. All individuals were reared on catalpa. Variation in the chitinization is apparently not due to the age of the adults, since similar heavily and lightly chitinized lobes were found on specimens three hours, ten hours, one day and one week after the last molt. It will be observed, however, that in none of the

variations are the pores closely concentrated around the spines, but are somewhat scattered over the more or less chitinized area.

Specimens, which have been stained enough to show the degree of chitinization of the anal lobes and the relative abundance of dorsal setae and pores, should be distinguished from *Pseudococcus maritimus*, which has fewer dorsal setae and pores and usually a weakly chitinized anal lobe, with pores always closely crowded around the cerarian spines, as shown in Fig. F.

On one specimen the left anal lobe possessed but a single spine (Fig. G), while the right lobe of the same individual was quite close to the typical form.

LITERATURE CITED

FERRIS, G. F., 1918—The California Species of Mealy Bugs, Leland Stanford Jr. Univ. Pub. Series.

An Appeal for Hungarian Entomologists.

EDITOR, ENTOMOLOGICAL NEWS:

I have received a sad story from Jósef Jablonowski, of Budapest, who is the editor of the publication known as *Folia Entomologica Hungarica*, published by the Hungarian Entomological Society. He writes me that the Society before the war had more than seven hundred members. Jablonowski has been president for ten years or more, Doctor Horvath having preceded him. Since the war, the society has lost more than two-thirds of its members for one reason or another, and they are at their wit's end to continue the publication. He wishes me to appeal to American entomologists and entomological societies for support of one kind or another. To illustrate his financial difficulties, he tells me that the printing of the edition and the postage costs of the second number of *Folia* (32 pages) were more than 4,500,000 kroner.

It occurs to me that you might insert some words to this general effect in a near number of ENTOMOLOGICAL NEWS. Of course, it will be difficult for American subscribers to read the articles, which are in the Hungarian language, but we old fellows know that most entomologists can read almost anything in lines that are of especial interest to them.

L. O. HOWARD, Bureau of Entomology, Washington, D. C.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., FEBRUARY, 1925.

Entomology at the Convocation Week Meetings, December 29, 1924 to January 3, 1925.

The meetings of the American Association for the Advancement of Science and of associated scientific societies were held at Washington, D. C., on the dates above mentioned. It was the seventy-ninth meeting of the Association and the fifth at Washington.

Papers relating in whole or in part to tracheate Arthropods were listed on the programs of the following twelve organizations:

American Society of Zoologists	16
The same with the Ecological Society of America	1
Entomological Society of America	29
The same with the Ecological Society of America	9
American Association of Economic Entomologists (including its sections on Apiculture and Horticultural Inspection)	93
Sigma Xi	1
Botanical Society of America	1
Joints Genetics Section of Amer. Soc. Zool. and Bot. Soc. Amer.	11
Section N, A. A. A. S., with Society of American Bacteriologists	1
Society of American Bacteriologists	1
American Physiological Society	1
Society of American Foresters	1
Potato Association of America	1
Total	166

These 166 papers were concerned with the following subjects:

i.		Nomenclature	1
Cytology	3	General Subjects	4
Anatomy	5	General Economic Entomology	8
Physiology	22	Insecticides	25
Behavior	7	Apiculture	10
Ontogeny	12	Insects Affecting Cereal, Forage and Field Crops	11
Genetics	11	Do. Truck Crops	10
Taxonomy	10	Do. Greenhouse Plants	4
Ecology	20	Do. Fruit	17
Parasites of Insects	2	Do. Stored Products	6
Insects Affecting Man and Animals	7	Do. Forest and Shade Trees	8
Evolution	2		
Bibliography	1		

ii.

Comprehensive Groups	7	Heteroptera	6
Araneina	1	Thysanoptera	1
Orthoptera	8	Coleoptera	20
Isoptera	4	Hymenoptera (excl. *Apis*)	9
Odonata	2	*Apis*	10
Neuroptera	1	Lepidoptera	24
Hemiptera in General	1	Mecoptera	1
Homoptera	25	Diptera (excl. *Drosophila*)	21
		Drosophila	6

Many of these figures are duplicated both between sections i and ii, and also within each section wherever a paper was of wide interests.

The total number of papers, 166, is less than that listed (180) for the Cincinnati meeting of the preceding year; this is largely due to the extensive ecological symposium of the Entomological Society at the Ohioan city, embracing 41 very brief papers. Entomological symposia as such were not the order of the day this year, although the program of the Economic Entomologists grouped the papers to a degree approaching that of such discussions. Two papers listed above were given in the Zoologists' symposium on "Sex Determination and Sex Differentiation."

The daylight meetings of the biological societies were held in the extensive Central High School building on Clifton Street. An excellent entomological exhibit was displayed in the room adjoining that occupied by the two societies of entomologists, the Entomological Society of America sitting the first three days, the Economic Entomologists on the last four days.

The annual address to the Entomological Society of America was on "The Needs of the World as to Entomology" and was given by Dr. L. O. Howard at the Cosmos Club on the evening of December 31. Its conclusion was marked by a hearty round of applause testifying to the esteem in which he is held by his colleagues and disciples. It was followed by a smoker for which we were indebted to the Entomological Society of Washington.

The annual address of the President to the Economic Entomologists, by Mr. A. F. Burgess, was given on Thursday morning, January 1, and was entitled "Our Association."

A biologists' smoker on Monday evening, December 29, at the new National Museum, was largely participated in by ento-

mologists, while the entomologists' dinner was held in Harvey's restaurant, Friday evening, January 2.

The annual Sigma Xi address this year was in applied entomology: "War on Diseases, with Special Reference to Malaria and Yellow Fever," by Dr. F. F. Russell, General Director of the International Health Board, given Tuesday evening, December 30, in beautiful Continental Memorial Hall.

The number of persons registered at the A. A. A. S. headquarters was above 4000; how many of these attended entomological meetings we have not attempted to estimate. We returned from a four days' stay in the capital with a pleasant recollection of old and new friends met, even if accompanied by a sense of confusion inevitable when so many societies meet simultaneously.

Third International Congress of Entomology.

Apropos of the editorial in the NEWS for January, page 27, I have just received another letter from Dr. Jordan in which he says the International Congress *will* be held July 19 to 26, 1925. "As general secretary we shall have Dr. Leuzinger, Gloriastrasse, 72, Zürich, 7." Dr. Jordan will have postal notices sent to all that attended the two previous meetings and such other persons that may have become interested since 1912. It is distressing to think the last one was 13 years ago.

HENRY SKINNER.

The New York State List of Insects.

It is gratifying to announce that the compilation of the proposed List of the Insects of New York State is now definitely to be completed. Dr. M. D. Leonard, who was appointed Editor-in-Chief while Acting State Entomologist of New York, returned to the Department of Entomology at Cornell University, Ithaca, New York, December last to again take charge of the project. His entire time will be devoted to the completion of this list and the New York State College of Agriculture has definitely promised publication provided the MS. is ready by June 1, 1925.

It is estimated that over 16,000 species will be listed as definitely occurring in New York, together with as complete distribution data within the State as is known for each species. Several orders are already practically completed. Over one hundred of the leading specialists are actively co-operating. The Editor of the list will greatly appreciate definite New York State records in all groups and will see that full credit is given to every co-operator.

Entomological Literature

COMPILED BY E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an *.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

The titles occurring in the Entomological News are not listed.

9—The Entomologist. **11**—Deutsche Ent. Zeitschrift. **18**—Internationale Entomolog. Zeit., Guben. **19**—Bulletin, Brooklyn Ent. Soc. **22**—Bulletin of Ent. Research. **25**—Bulletin, Soc. Ent. France. **26**—Entomolog. Anzeiger, Wien. **45**—Zeit. f. Wissenschftl. Insekentb., Berlin. **49**—Entomolog. Mitteil., Berlin. **61**—Proceedings, California Acad. of Sciences. **62**—Bull., Amer. Mus. Nat. Hist., New York. **68**—Science. **69**—Comptes Rendus des Seances, Acad. Sci. Paris. **75**—Annals and Mag. of Nat. History, London. **77**—Comptes Rendus d. Seances, Soc. Biologie, Paris. **89**—Zool. Jahrbucher, Jena. **103**—Proc., Zool. Soc. London. **105**—Proc., Biol. Soc. Washington. **115**—Jour. of Morphology, Philadelphia. **118**—Die Naturwissenschaften, Berlin. **129**—Jour. of Parasitology, Urbana.

GENERAL. Crampton, G. C.—Notes on the relationships indicated by the mandibles of certain holometabolous insects. **19**, xix, 158-63. **Dover, C.**—The terminology of homotypes of insects. **68**, lx, 590. **Dunn, M. S.**—Social insects. (Popular Sc. Lect., Phila. Coll. Phar. & Sci., ii, 90-113.) **Gershenfeld, L.**—Household insect pests and how to rout them. (Popular Sc. Lect., Phila. Coll. Phar. & Sci., ii, 114-53.) **Isaac, P. V.**—A practical and simple method for rearing tabanid larvae. (Mem. Dept. Agr. India, Ent. Ser., viii, 53-9.) **Seydel, C.**—Ueber eine-ausserst wirksame, prakt. u. sparsame vorrichtung zur abwehr bzw. abtotung von raubinsekten in Ent. Samml. **45**, xix, 220-3.

ANATOMY, PHYSIOLOGY, MEDICAL, ETC. Bowen, R. H.—Studies on insect spermatogenesis. **115**, xxxix, 351-414. **Bugnion, E.**—Le sac infrabuccal et le

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Borgmeier, T.—Catalogo syst, e synon. das formigas do Brasil. (Achiv. Mus. Nac. Rio de Janeiro, xxiv, 33-103.) **Lovell, J. H.**—The bees of Maine (Maine Nat. Jour., iv, 71-6. Cont.) ***Mitchell, T. B.**—New megachilid bees. (Jour. Elisha Mitchell Sci. Soc., xl, 154-65.) **Robertson, C.**—Systematic position of Dasygastrae. **19,** xix, 181. ***Sandhouse, G. A.**—Bees of the genus Osmia in the collection of the Cal. Acad. Sci. **61,** xiii, 341-72. ***Sandhouse & Cockerell.**—The bees collected on the expedition to the Gulf of California in 1921. **61,** xiii, 333-9. ***Taylor, L. H.**—Chrysididae from Lower California. **61,** xiii, 325-32.

SPECIAL NOTICES.

Deuxieme expedition antarctique Francaise.—(1908-1910), J. Charcot. Sci. Nat. Docum. Scient. This work, the pertinent parts of which were published in 1913, have just been received at the Academy here. The following orders are covered: Dipteres, par Keilin; Mallophaga et Ixodidae, par Neumann; Collemboles, par Ivanof. **Macrolepidoptera of the World.**—Faun. Amer., Pts., 155, 156. These parts contain pages 45-84 of volume 8, and treat of the genera Euxoa to Protagrotis, by M. Draudt. **What killed off fossil animals?**—Paleopathological development. By H. Winsor. This article was published in the Western Medical Times, 1924. Suggestion is made that insects and insect-born diseases may have been responsible for the unexplained extinction of fossil animals.

The Tsetse Flies.

When Austen's Handbook of the Tsetse Flies appeared in 1911, with 110 pages of text and ten beautiful colored plates, it seemed that there was little remaining to be said on the taxonomy of *Glossina*. Nevertheless, during the next dozen years about half a dozen new species were discovered, and the additions to our knowledge of the morphology, distribution, habits and natural enemies of the tsetse flies were voluminous. The volume just received from the University Press of Liverpool, by Professor R. Newstead, with the collaboration of Alwen M. Evans and W. H. Potts, bears the title "A Guide to the Study of Tsetse Flies." It may fairly be called a monograph, for it covers the subject in great detail, with 332 pages, 28 plates and four maps. The genitalia have been minutely studied, and in every case illustrated by large drawings. The distribution is given in detail, and all available particulars about parasites and predatory enemies have been gathered together. If all groups of insects could be dealt with in the same thorough manner, Entomology would advance as we can hardly now imagine, with varied benefits to mankind. But even were the work to be done, it would, in a world so generally indifferent to scientific progress as that of today, be impossible to print the results. The tsetse fly is favored because, like the sensational criminal who gets the front page, it is a conspicuous malefactor.

The taxonomic treatment is so careful that it appears to be final, except that other views are likely to be taken concerning certain categories. Thus, the authors are no doubt correct in refusing to divide *Glossina* into several genera, but they do set forth three groups, of which they say that they "are so widely different as to lead one to assume, without taking the other external features into consideration, that they represent three distinct genera." Thus they themselves have supplied ample reasons for recognizing subgenera, which will take the names *Glossina* proper, *Nemorhina* Rob.-Desv. (not *Nemorhinus* Schönh.), and *Austenina* Townsend.* Again, the authors cite several color-varieties, but also supposed subspecies or races which differ in their genitalia, and so far as we may judge, are actually valid species. *G. congolensis* (Newst. and Evans), called a variety of *G. fusca*, represented by numerous examples, is structurally distinct in the genitalia of both sexes. *G. fuscipes* Newst., now called a subspecies of *G. palpalis*, is

* The figures on Plate I seem to suggest that these subgenera may be further defined by venational characters, but I have examined the actual flies, and do not find that this is the case.

distinct both in genitalia and distribution. *G. disjuncta* (Potts), called a variety of *G. schwetzi*, is based on a single specimen, but it has good structural characters.

Although the literature on fossil tsetse flies is cited in the bibliography, it is singular that the only reference to them in the text which occurs in the foreword by Professor Stephens, is misleading. The writer says "*Glossina* has existed from Pleistocene times, as fossil remains prove," but we know nothing of Pleistocene *Glossina*. The four species from Florissant date from the Miocene Tertiary. T. D. A. COCKERELL.

REPORT OF THE PROCEEDINGS OF THE FIFTH ENTOMOLOGICAL MEETING HELD AT PUSA on the 5th to 10th February, 1923. Edited by T. BAINBRIGGE FLETCHER, Imperial Entomologist. Calcutta Superintendent Government Printing, India, 1924. Pp. xiii, 422, 37 plates.—This meeting was attended by 41 members and 4 visitors; 13 contributors, not present, were represented by papers. The 61 pages read are grouped under 12 sections: Crop Pests, 25; Forest Entomology, 2; Medical and Veterinary Entomology, 5; Household and Store Pests, 1; Lac, 1; Silk, 1; Life-histories and Bionomics, 10; Collection and Preservation, 1; Systematic Entomology, 9; Publications and Organization, 4; Miscellaneous, 2. While the Indian Empire is the main area under discussion in this volume, there are in its pages many topics of interest to entomologists everywhere. We have space to mention only a few of them.

As a result of the deliberations following Mr. Fletcher's paper, "The American Cotton Boll-Weevil: A Menace to India," in which an opinion by Dr. W. D. Hunter is quoted, the Conference unanimously passed a resolution that certificates or warehouse receipts that imported cotton was more than six months old will not afford adequate protection against the introduction of weevil and "that the Indian Central Cotton Committee should consider the advisability of recommending the total prohibition of cotton from America; and as alternative, that all bales containing such cotton should be fumigated at port of entry and that such entry should be restricted to Bombay." C. C. Ghosh records *Cirphis unipuncta* caterpillars appearing in large numbers and behaving as an "army worm" in three different districts in Burma, in 1922. R. B. C. S. Misra tells of "The Citrus White-fly, *Dialeurodes citri*, in India and its Parasites, together with the Life-history of *Aleyrodes ricini*" in connection with the shipping of some of the living parasites to Prof. J. R. Watson, of the University of Florida. Of much interest in its field is Dr. C. F. C. Beeson's "The Geographical

Distribution of the Coleopterous Borers of *Sal (Shorea robusta)*." In "The Bionomics of the Sarcoptic Mange Parasite of the Buffalo," T. M. Timoney describes a method for observing the daily average number of eggs laid by numerous ovigerous females in their galleries and for studying the life-cycle; the resistance of the parasite to adverse natural (sunshine, darkness, moisture, dryness) and artificial (an acaricidal agent) conditions; and the resistance of eggs to the same active and passive conditions. M. O. T. Iyengar summarizes the views of Roubaud and others on "The Importance of Animal Prophylaxis in Malaria" and adds some observations from India. In "The Evolution of the Faculty of Communication in Arts," Major R. W. G. Hingston, author of *A Naturalist in Himalaya*, traces step by step the development of communication by the olfactory sense in *Phidole indica* from the use of tactile stimuli in such an ant as *Camponotus sericeus*. Interesting surveys of advances in taxonomy are contained in B. P. Uvarov's "The Collection and Study of Indian Orthoptera" and R. Senior White's "Recent Progress in Our Knowledge of Indian Diptera." R. B. C. S. Misra's "List of Coccidae in the Pusa Collection" states that "The San José Scale is a serious pest in Kashmir and is very far from being under control," examples being given. H. Singh, after recounting difficulties in persuading farmers that caterpillars develop into moths, suggests "Methods to be adopted to make the Indian Farmers believe in the instructions for Killing Insect-Pests." Under "Co-operation in Indian Entomology," Mr. Fletcher makes the regrettable announcement that "on account of increasing provincialization and financial stringency Government have now definitely abandoned the idea of a [centralized] Entomological Service and have postponed indefinitely the creation of an Entomological Institute," which promised to reduce "the present enormous annual wastage of the wealth of the country." This waste is estimated in a second article, "Publicity for Entomology in India," at "two thousand millions of rupees [= $700,000,000] every year . . . more than the entire revenue of the Government of India." In the course of discussion on these subjects a resolution was adopted "That this Meeting recommends to the Indian Universities that the subject of Entomology be taught as of equal rank with other branches of biological science in the courses of study for the examinations of the Universities for degrees in Science including Agriculture." Almost at the end of the volume, C. C. Ghosh has notes on "A Few Insects Used as Food in Burma."

Finally there is an Index of 14 pages. P. P. CALVERT.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Have a number of pamphlets and books on N. A. and exotic Cerambycidae. Will exchange these for certain families of Heteroptera and Tabanidae. G. Chagnon, P. O. Box 521, Montreal, Canada.

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